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Chae-Whan Lim

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EXAMINER

ABDI, AMARA

ART UNIT

PAPER NUMBER

2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/765,071

Applicant(s)

LIM ET AL.

Examiner

Amara Abdi

Art Unit

2609

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 06/16/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "**110** in figure 1" and "**600** in figure 9" have both been used to designate "**Input**".

The same informality for the following reference characters:

- "**120** in figure 1" and "**313** in figure 5" and "**620** in figure 9" have been used to designate "**Block Classification**"
- "**130** in figure 1" and "**315** in figure 5" and "**640** in figure 9" have been used to designate "**Median filter**"
- "**140** in figure 1" and "**317** in figure 5" have both been used to designate "**Position search**"
- "**150** in figure 1" and "**319** in figure 5" and "**680** in figure 9" have been used to designate "**ROC Extraction**"
- "**160** in figure 1" and "**321** in figure 5" and "**690** in figure 9" have been used to designate "**ROC Extension**"
- "**170** in figure 1" and "**323** in figure 5" have both been used to designate "**Recognition**"
- "**180** in figure 2" and "**312** in figure 6" and "**610** in figure 9" have been used to designate "**Mean filter**".

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

Art Unit: 2609

replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claims 1-5,6-7,8,9-10,11-15,16-17,18,19-20 are objected to because of the following informalities:

(1) **Claim 1**, line 9 and 10, "**a character**" should be changed to "**the character**", and the same informality was found in **claim 4**, line 11; **claim 6**, on line 28, and on page 33, line 1; **claim 8**, line 21 and 22; **claim 9**, line 11 and 12, on page 34; **claim 14**, line 28; **claim 16**, line 16; **claim 18**, line 9, on page 37; and **claim 19**, line 30.

On line 11, "**a position**" should be changed to "**the position**", and the same informality was found in **claim 4**, line 10 and 12; **claim 6**, on line 2, page 33; **claim 8**, line 23; **claim 9**, line 13; **claim 14**, line 28 and line 30.

On line 12, "**an image**" should be changed to "**the image**", and the same informality was found in **claim 6**, line 26 and line 3 page 33; **claim 8**, line 19 and 24; **claim 9**, line 14; **claim 11**, line 31; **claim 16**, line 19, **claim 18**, line 12; **claim 19**, line 1 on page 38;

Art Unit: 2609

(2) **Claim 2**, line 24, "**an** energy" should be changed to "**the** energy", and the same informality was found in **claim 3**, line 5; and **claim 13**, line 21;

On line 26 and 27, "**a** threshold" should be changed to "**the** threshold"

On line 32, "**a** first" should be changed to "**the** first", and the same informality was found in **claim 12**, line 17

On line 1, page 32, "**a** second" should be changed to "**the** second", and the same informality was found in **claim 12**, line 18

(3) **Claim 8**, line 12, "**an** input" should be changed to "**the** input"

(4) **Claim 9**, line 17, "**a** size" should be changed to "**the** size"

(5) **Claim 12**, line 9 and 10, "**a** corresponding" should be changed to "**the** corresponding".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Simard et al. (US 7,024,039).

(1) Regarding claims 1 and 11:

Art Unit: 2609

Simard et al. disclose a system (device) and method (column 1, line 16-17) for extending a character region in an image comprising:

an input part for receiving an input image (column 6, line 17-20);

a block classification part for classifying the input image into character blocks and background blocks, and converting pixels in the character blocks into pixels having a first brightness value and pixels in the background blocks into pixels having a second brightness value (column 2, line 63-66) and (column 6, line 30-34) and (column 6, line 41-44), (the examiner interpreted a character blocks as foreground and a classification as decomposition or division)

a position search part for searching for left, right, top and bottom positions of a character region by horizontally and vertically scanning the block-classified image, and determining a position of the character region (column 8, line 1-7), (the examiner interpreted that the boundary detector (110 in figure 10) has the same function as the position search part since it identifies the merged region boundary for which one side is foreground and other side is background therefore it determines the position of the character region);

an region of contents (ROC) extraction part for extracting an image in the determined position of the character region from the input image (column 6, line 23-25), (The examiner interpreted that the image retoucher (100 in figure 1) detects or extract the image comprising foreground and background utilizing the information stored in the binary mask); and

Art Unit: 2609

an ROC extension part for extending the extracted image of the character region to a size of the input image (column 6, line 50-52), (the examiner interpreted that the image retoucher (100 in figure 1) further adapted to extend the extracted image to the size of the input image)

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2,3,12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al. in view of Viscito et al. (US 6,782,135), and further in view of Hirabayashi (US 5,900,910)

(1) Regarding claims 2 and 12:

Simard et al. disclose a device a method for extending a character region in an image as above in claims 1 and 11.

Furthermore, Simard et al. disclose a method and a block classification part, which comprises an image division part for dividing the input image into blocks having a predetermined size (column 3, line 26-27).

However, Simard et al. does not disclose a method and a block classification part which comprises:

1) a discrete cosine transform (DCT) conversion part for DCT-converting the divided blocks; an energy calculation part for calculating a sum of absolute values of dominant DCT coefficient; a threshold calculation part for summing up the energy calculated, and generating threshold by dividing the summed energy value by the total number of the blocks; and a classification part, classifying the blocks into character blocks as recited in claims 2 and 12.

2) a block filling part for filling the character blocks and background blocks with pixels having first and second brightness respectively as recited in claims 2 and 12.

(1) Regarding item 1) above:

Viscito et al. teaches a method and system of a discrete cosine transform (DCT) conversion part (306 in figure 3a.), (column 6, line 18), and an energy calculation part (701 in figure 7) for calculating a sum of absolute values (column 9, line 60) and outputting the calculated sum as an energy value of a corresponding blocks (column 9, line 56-63); and a threshold calculation part (806 in figure 8) calculation for summing up the energy values calculated (column 9, line 61-63), and generating the threshold by dividing the summed energy value by the total number of the blocks (column 9, line 63-65); and a classification part (figure 10b) for classifying the blocks (column 11, line 58-61) and (column 12, line 1-4) by comparing the received block energy values with the threshold (Column 12, line 14-16).

One skilled in the art would have clearly recognized the block classification part in a digital video quantization comprising and a conversion part (DCT) (column 6, line 35), an energy calculation part (column 9, line 27), a threshold calculation part (column 12,

Art Unit: 2609

line 15) and a classification part (column 11, line 58-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Viscito et al. where the block classification comprises a discrete cosine transform, an energy calculation part, a threshold calculation part, and a classification part in the system of Simard et al. because such feature provides an accurate and an efficient method for a picture quantization and enables lower more optimally distributed bit rate video compression, also the information can be analyzed accordance with significant picture attributes out (column 3, line 1-2).

(2) Regarding item 2) above:

Hirabayashi et al. in the same field of invention teaches a block filling part for filling the character blocks, with pixels having the first brightness value and filling background blocks with pixels having the second brightness value. (Column 4, line 66), (column 4, line 39-40), and (column 5, line 15) (The examiner interpreted the character blocks as blocks A and background blocks as blocks B).

One skilled in the art would have clearly recognized the block filling part for filling the character blocks and the background blocks with pixels having first and second brightness (column 5, line 55-57). Therefore it would have been obvious to one in ordinary skill at the time of the invention to combine the system of Hirabayashi et al., which comprises a block filling part in the system of Simard et al. because such feature will provide a movement vector which can detect a reliable movement vector (column 2, line 13-14). Furthermore this feature will distinguish the pixels and filling all the gaps in

Art Unit: 2609

different blocks based on the brightness, which will make the classification more efficient.

(2) Regarding claims 3 and 13:

Simard et al. disclose a device and method for extending a character region in an image as above in claims 1,2,11 and 12.

However, Simard et al. does not disclose a device and method where each of the blocks has a size of 8x8 5 pixels, and an energy value as recited in claims 3 and 13.

However, Viscito et al. teaches a method and system where each block has 8 row by 8 column pixel block (column 9, line 55), where the DCT coefficient values are accumulated (summed) (column 9, line 53) (calculate the absolute value thereby avoiding the use of negative values) (column 9, line 60), (the examiner interpreted that Viscito et al. using the same principal to determine the energy except, he is dividing the absolute value of summed energy by 64 which is the number of pixels therefore he is determining the threshold for each pixel).

One skilled in the art would have clearly recognized the sum of the absolute values of the DCT coefficients the block (column 9, line 53). Therefore it would have been obvious to one in ordinary skill at the time of the invention to combine the system of Viscito et al. where the sum of the absolute values of dominant DCT are calculated in the system of Simard et al. because such feature provides a rough approximation of how distortion generally tends to combine into an integrated whole in a picture (column 2, line 35-36) and enabling accurate and efficient video quantization and it will be possible for modeling the human visual system (column 2, line 55-57).

8. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al. in view of Kodaira et al. (US 6,043,823).

Simard et al. disclose a device and method for extending a character region in an image as above in claims 1 and 11.

However, Simard et al. does not disclose that the character region has an aspect ratio of the input image as recited in claims 4 and 14.

However, Kodaira et al. teaches a system and method where the character region has an aspect ratio of the input image (column 27, line 52-55).

One skilled in the art would have clearly recognized the method and device where the position search part searches the position of the character region (column 27, line 46-48) so that the character region has an aspect of ratio of the input image (column 27, line 52). Therefore it would have been obvious to one in ordinary skill at the time of the invention to combine the system of Kodaira et al. which has the aspect ratio of the input image in the system of Simard et al. because such feature makes the length allowing to merge characters adjacent to each other in one row when the input image has relatively large tilt (column 30, line 46-48).

9. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al. in view of admitted prior art (see pages 18 and 19 in the specification)

(1) Regarding claims 5 and 15:

Art Unit: 2609

Simard et al. disclose a device and method for extending a character region in an image as above in claims 1 and 11.

However, Simard et al. does not disclose the method and device where the ROC extension part performs bilinear interpolation of the extracted image of the character region according to the equation recited in claims 5 and 15.

However, the admitted prior art discloses the interpolation method and operation (equation (4), page 18, line 28).

One skilled in the art would have clearly recognized the interpolation operation to achieve the image extension (line 1, page 19). Therefore it would have been obvious to one in ordinary skill at the time of the invention to combine the interpolation equation of the admitted prior art in the system of Simard et al. because such feature makes the size of the image of the extracted character region equal to that of the input image which will make the extension of character image to the size of the input image (page 19, line 2-3).

10. Claims 6,7,8,16,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al. in view of Otsuka (US 6,731,820).

(1) Regarding claims 6,7,16 and 17:

Simard et al. disclose a method and device for extending a character region in an image as above in claims 1 and 11.

However, Simard et al. does not disclose a median filter for performing median filtering on an image output from the block classification part to remove blocks erroneously

Art Unit: 2609

classified as character blocks as recited in claims 6 and 16, and the median filter determines isolated character blocks as erroneously classified character blocks as recited in claims 7 and 17.

However, Otsuka teaches an image filter circuit and a filtering method (paragraph [0013], line 3-4) where the median filter performs a median filtering on an image output (See the abstract, line 1-2) to remove blocks erroneously classified as character blocks (Paragraph [0016], line 6-7), (the examiner interpreted that the function of eliminating of dot noise in an image by the median filter is the same as the removing of the character blocks).

One skilled in the art would have clearly recognized a median filter to remove parts or blocks in an image which are not desirable (see the abstract) and (paragraph [0013], line 3-4). Therefore it would have been obvious to one in ordinary skill at the time of the invention to add the median filter of Otsuka in the system of Simard et al. because such feature will eliminates the undesirable character blocks which were classified by mistake, as well as the median filter can be applied to a system constituted by plurality of devices (example: a host computer, an interface, a reader and a printer) or an apparatus comprising a single device (example: copy machine).

(2) Regarding claims 8 and 18:

Simard et al. disclose a method and device for extending a character region in an image as above in claims 1 and 11.

However, Simard et al. does not disclose a mean filter for performing mean filtering on the input image to blur the input image as recited in claims 8 and 18.

Art Unit: 2609

However, Otsuka teaches an image filter circuit and a filtering method as shown in figure 11, where the mean filtering is performed (S101 and S102 in figure 11), (paragraph [0078], line 1-3), and (paragraph [0079], line 1-4).

One skilled in the art would have clearly recognized the mean filtering of the input image in order to make it vague (paragraph [0077], line 1-3) and (paragraph [0083], line 1-4).

Therefore it would have been obvious to one in ordinary skill at the time of the invention to add the mean filter of Otsuka in the system of Simard et al. because such feature will make the input image as blurred, as result it will be easy for the median filter in next step to search for the target class based on the output image from the mean filter, so it can eliminate the character blocks which were classified by mistake.

11. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al., and Otsuka as applied in claims 1,8,11 and 18 above, and further in view of Kondo et al. (US 5,966,183).

Simard et al. disclose a method and device for extending a character region in an image as above in claims 1,8 and 11.

However, Simard et al. does not disclose a method and subsampling part for subsampling pixels in the image output from the block classification part to reduce the number of the pixels; and an interpolation part for performing interpolating on the median filtered image to extend the median filtered image to a size of the input image as recited in claims 9 and 19.

Art Unit: 2609

However, Kondo et al. teaches signal conversion method and a signal converter system for subsampling pixels in the image (column 6, line 44-45), and the interpolated part for performing interpolation on the median filtered image (see abstract), (column 2, line 30-32), (the examiner interpreted that the interpolation function from pixels of the input image is the same as the interpolation function from pixels of the median filter image). One skilled in the art would have clearly recognized the subsampling pixels in the image output (column 6, line 44-45), and an interpolation of the pixels from pixels of the median filter image (column 3, line 37-38). Therefore it would have been obvious to one in ordinary skill at the time of the invention to add the subsampling part and the interpolation part of the system of Kondo et al. in the system of Simard et al. because such feature converting the input image into high definition HD image with high prediction accuracy by suitably classifying and evaluating an input image (column 2, line 10-15).

12. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simard et al., Otsuka and Kondo et al. as applied in claims 1,8,9,11,18 and 19 above, and further in view of Astle (US 5,684,544)

(1) Regarding claims 10 and 20:

Simard et al. disclose a method and device for extending a character region in an image as above in claims 1,9,11, and 19.

However, Simard et al. does not disclose the method and sampling part, which samples the pixels at the subsampling ratio as the formula recited in claims 10 and 20.

Art Unit: 2609

However, Astle teaches method and system where the subsampling part (300 in figure 3) subsampling the pixels using the ratio aspect (column 5, line 50-51), (the examiner interpreted the ratio aspect (4:1) as the ratio aspect recited in claim 10).

One skilled in the art would have clearly recognized the subsampling part where the pixels are subsampled at ratio aspect in both horizontal and vertical directions (column 5, line 44-52). Therefore it would have been obvious to one in ordinary skill at the time of the invention to combine the subsampling ratio aspect of the system of Astle in the system of Simard et al. because in such feature some pixels are typically subsampled by representing multiple pixels with a single pixels, so the multiple pixels can be encoded and transmitted with smaller code size witch will increase the filtering process in the median filter part.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bottou et al. (US 6,144,767) disclose a method and pattern recognition and feature extraction using low degree polynomial covers for region approximation.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

Art Unit: 2609

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi  
01/25/2007



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